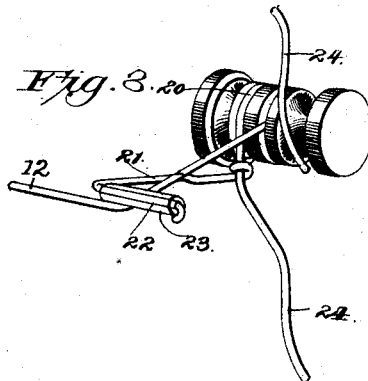
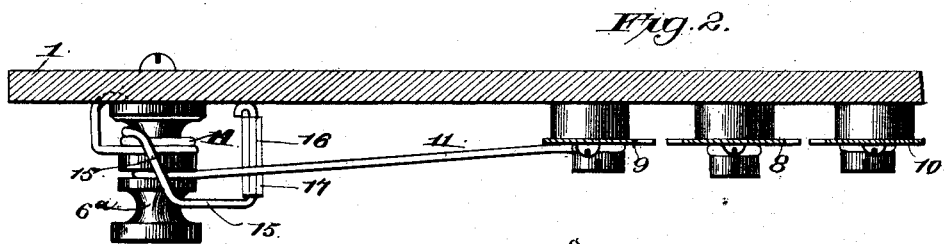
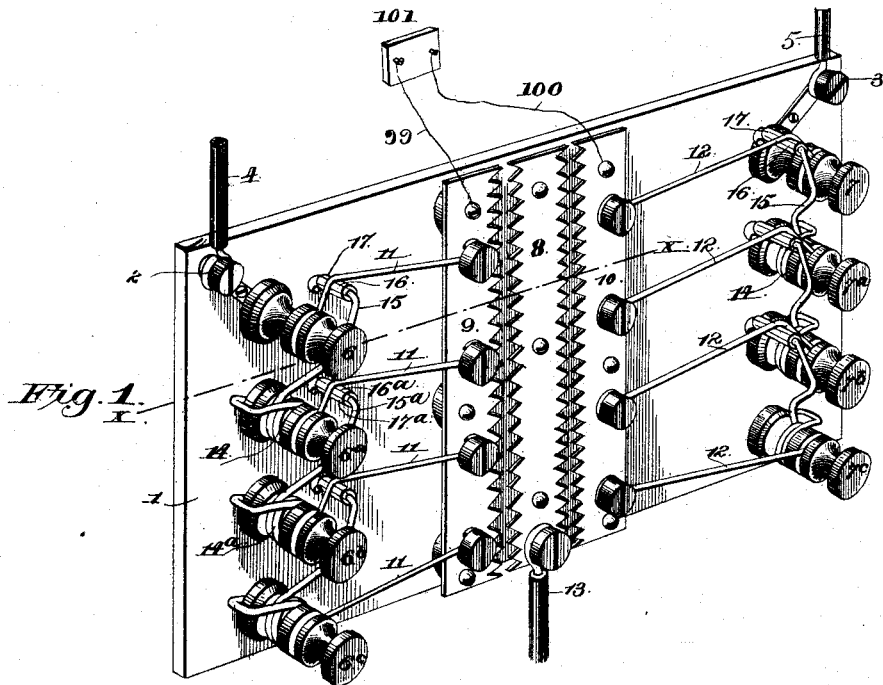


(No Model.)

G. G. BAYNE.  
LIGHTNING ARRESTER.

No. 420,984.

Patented Feb. 11, 1890.



Witnesses

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*Wm. Bagger*

By *his* Attorneys,

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*George A. Bayne*

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# UNITED STATES PATENT OFFICE.

GEORGE G. BAYNE, OF FREMONT, NEBRASKA.

## LIGHTNING-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 420,984, dated February 11, 1890.

Application filed October 1, 1889. Serial No. 325,694. (No model.)

### *To all whom it may concern:*

Be it known that I, GEORGE G. BAYNE, a citizen of the United States, residing at Fremont, in the county of Dodge and State of Nebraska, have invented a new and useful Lightning-Arrester for the Protection of Electrical Apparatus, of which the following is a specification.

This invention relates to lightning-arresters for the protection of electrical apparatus; and it has for its object to provide a device which shall be included in the electrical circuit and by means of which, in the case of the circuit being struck by lightning, the current shall be immediately grounded and injury to the apparatus and interruption in the operation of the same thereby avoided.

With these ends in view the invention consists in the improved construction, arrangement, and combinations of parts which will be hereinafter described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a perspective view of my improved lightning-arrester. Fig. 2 is a sectional view taken on the line *xx* in Fig. 1. Fig. 3 is a perspective detail view illustrating a modification.

Like numerals of reference indicate like parts in all the figures.

1 designates a base-board constructed of suitable insulating material and provided at its upper corners with binding-posts 2 3, by means of which it is connected with the conducting-wires 4 5 of the circuit in which the apparatus which is to be protected is located. The said base-board may be secured to the wall in any suitable position between the exposed parts of the circuit and the apparatus to be protected. At each side of the base-board is arranged a vertical series of binding-posts, designated, respectively, by 6 6<sup>a</sup> 6<sup>b</sup> 6<sup>c</sup> and 7 7<sup>a</sup> 7<sup>b</sup> 7<sup>c</sup>. The binding-posts 6 and 7 are electrically connected, respectively, with the binding-posts 2 and 3. Upon the base-board 1 and centrally between the two vertical series of binding-posts is arranged a plate 8, of conducting material, having toothed or pointed edges, and adjacent to the said plate are secured the plates 9 and 10, the inner edges of which are likewise toothed or pointed, the points of the teeth of the several plates being

arranged directly opposite to each other, in order that the electric current may pass uninterruptedly between the said plates. The latter are connected electrically by the conducting-wires 99 100 with the instrument 101 which is to be protected. Each of the binding-posts 6 6<sup>a</sup> 6<sup>b</sup> 6<sup>c</sup> is connected with the plate 9 by a wire 11 of any suitable conducting material which shall be fusible at a low temperature, and a similar wire 12 connects each of the binding-posts 7 7<sup>a</sup> 7<sup>b</sup> 7<sup>c</sup> with the plate 10. A conductor 13 connects the plate 8 with the ground where it is buried at a sufficient depth to insure moisture at all times. To the binding-post 6<sup>a</sup> is attached one end of a spring 14, which is coiled around the said binding-post, as shown, and has an outwardly-extending arm 15, the outer end of which is bent so as to form a crank 16, upon which is mounted sleeve 17, of insulating material which is adapted to bear against the wire 11, which connects the binding-post 6 with the plate 9. The arm 15 is thereby held out of contact with the binding-post 6. A similar spring 14<sup>a</sup> is coiled upon the binding-post 6<sup>b</sup>, and has an outwardly-extending arm 15<sup>a</sup>, provided at its outer end with a crank 16<sup>a</sup>, having an insulating-sleeve 17<sup>a</sup>, adapted to bear against the wire 11, which connects the binding-post 6<sup>b</sup> with the plate 9. Upon the binding-post 6<sup>c</sup> a similar spring is coiled, having a crank-arm provided with an insulating-sleeve bearing against the wire 11, that connects the binding-post 6<sup>c</sup> with the plate 9. The binding-posts 7<sup>a</sup>, 7<sup>b</sup>, and 7<sup>c</sup>, upon the opposite side of the base-board, are likewise each provided with a spring or elastic arm having a crank provided with an insulating-sleeve that bears against the fusible wire connecting the binding-post next above with the plate 10. Each of the spring-arms is thus under normal circumstances kept out of contact with the binding-post next above, while in the event of the wire connecting the binding-post next above with the adjacent arrester-plate being fused its resiliency will immediately place the said spring-arm in contact with the binding-post next above.

Under ordinary circumstances the circuit is from the conductor 4 through the binding-posts 2 6, wire 11, plate 9, and to the instrument 101; thence to the plate 10, wire 12,

binding-posts 7 and 3, and to the line-wire 5. In the event of the exposed parts of the end of the circuit including the conductor 4 being struck by lightning, the electrical current induced will follow the conductor 4 to the binding-post 2 and pass through the latter and through the binding-post 6 and fusible wire 11 to the arrester-plate 9, and thence through the plate 8 to the ground-wire 13, which, as stated, is buried at a sufficient depth to insure an abundance of moisture at all times. This continues until the lines receive lightning sufficient to melt the fusible wire 11, connecting the binding-posts 6 with the plate 9, thereby cutting off connection between the arrester and the circuit. As soon as this takes place, the arm 15 of the spring 14, coiled upon the binding-post 6, is by its resiliency placed in contact with the binding-post 6, thus instantly and automatically completing the circuit. This operation may be repeated as long as any of the fusible wires remain in the apparatus, and it is obvious that their number may be increased without limit. When the end of the circuit including the conductor 5 is struck by lightning, substantially the same operation as above described will take place, the current being grounded through the plate 10 of the apparatus.

After any electric storm the apparatus may very easily and quickly be restored to working condition by simply replacing the fusible wires that have been destroyed.

By the modification which has been illustrated in Fig. 3 of the drawings I substitute for the resilient arms hereinbefore described a gravity device consisting of a collar mounted upon one of the binding-posts, as shown at 20, and having an outwardly-extending arm 21, provided with a crank 22, having an insulating-sleeve 23, adapted to rest upon the fusible wire 12, which connects the said binding-post with the adjacent arrester-plate. The collar 20 is likewise provided with a downwardly-extending arm 24, which, when the fusible wire supporting the crank-arm 21 burns, drops into contact with the binding-posts next below, thus completing the circuit. The operation of this device is identical with that described above and requires no extended explanation.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of my invention will be readily understood by those skilled in the art to which it appertains.

The construction of my improved lightning-arrester is simple and inexpensive, and it

forms a complete and efficient safeguard for the protection of electrical apparatus from injury by reason of the induced currents arising during electric storms.

In the detailed construction of the device various modifications and alterations might be made, and I reserve the right to any such changes as may be made without departing from the spirit of my invention.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a lightning-arrester, the combination of a central arrester-plate having toothed edges, a ground-wire connected to the same, the adjacent arrester-plates having toothed inner edges, two vertical series of binding-posts connected by fusible wires with the outer arrester-plates, conductors connecting one binding-post of each series with the line-wires, and mechanism whereby in the event of the fusing of the wire connecting said binding-post with the adjacent arrester-plate the said binding-post shall be automatically placed in electrical connection with the next adjacent binding-post of the same series, substantially as set forth.

2. In a lightning-arrester, the combination of an arrester-plate, a series of binding-posts, fusible wires connecting the said binding-posts with the said arrester-plate and the electrical conductor connecting one of said binding-posts with the line-wire, and spring-arms attached to each of the remaining binding-posts and having insulating-sleeves bearing against the fusible wires connecting the binding-posts next above with the arrester-plate, thereby holding each of said resilient arms out of contact with the binding-post next adjoining, substantially as for the purpose set forth.

3. In a lightning-arrester, the combination of a series of binding-posts, fusible wires connecting said binding-posts with an arrester-plate, an electrical conductor connecting one of said binding-posts with the line-wire, springs coiled upon each of the remaining binding-posts, arms extending outwardly from said springs and having cranks at their outer ends, and insulating-sleeves mounted upon the said cranks, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

GEORGE G. BAYNE.

Witnesses:

W. DE L. FREEMAN,  
S. W. BOYD.